

## New records and a new species of *Hermundura* Müller, 1858, the senior synonym of *Loandalia* Monro, 1936 (Annelida: Phyllodocida: Pilargidae) from northern Australia and New Guinea

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### ABSTRACT

The Principle of Priority (ICZN 1999) is applied in resurrecting the generic name *Hermundura* Müller, 1858 for pilargid polychaetes (Annelida) formerly referred to as *Loandalia* Monro, 1936 and *Parandalia* Emerson & Fauchald, 1971. All available specimens of *Hermundura* from northern Australia and New Guinea are described based on material held in the collections of Australia's natural history museums. Our study recognises two species, *H. gladstonensis* (Marks & Hocknull, 2006) comb. nov. and a new species, *H. philipi* sp. nov., from near Mornington Island in the southern Gulf of Carpentaria. The former species is redescribed, and new information on intraspecific variability is provided, including the presence of hardened, cuticular structures and a muscle band (sphincter) of the anterior alimentary canal. Analysis of these structures has led to a re-evaluation of the so-called 'jaws' of the closely related monotypic genus *Talehsapia* Fauvel, 1932, and the conclusion that they are homologous with the pharyngeal sphincter of *Hermundura*. *Talehsapia* therefore is also synonymised with *Hermundura*. The genus *Hermundura* now contains 17 species including the type species, *Hermundura tricuspis* Müller, 1858, *H. philipi* sp. nov., and fifteen others, which are all new name combinations, viz. *Hermundura annandalei* (Fauvel, 1932), *H. aberrans* (Monro, 1936), *H. fauveli* (Berkeley & Berkeley, 1941), *H. americana* (Hartman, 1947), *H. gracilis* (Hartmann-Schröder, 1959), *H. indica* (Thomas, 1963), *H. ocellaris* (Emerson & Fauchald, 1971), *H. maculata* (Intes & Le Locuff, 1975), *H. bennei* (Solís-Weiss, 1983), *H. riojai* (Salazar-Vallejo, 1986), *H. vivianneae* (Salazar-Vallejo & Reyes Barragán, 1986), *H. evelinae* (León-González, 1991), *H. salazarvallejoi* (León-González, 1991), *H. fredrayorum* (Marks & Hocknull, 2006) and *H. gladstonensis* (Marks & Hocknull, 2006). The genus *Hermundura* appears to be restricted to the tropics and subtropics, both in Australia and globally.

KEYWORDS: Polychaeta, Pilargidae, systematics, taxonomy, redescription, synonymy, new combination.

### INTRODUCTION

The concept and validity of *Loandalia* Monro, 1936, a genus of pilargid polychaetes, has been in flux since it was originally described by Monro (1936) based on *L. aberrans* from a specimen from the continental shelf off Angola, southwest Africa. Monro was unable to assign it unequivocally to a family, although he favoured the Hesionidae. Later, *Loandalia* was assigned to the Pilargidae by Hartman (1947), and it was treated as an established member of that family in the revision by Pettibone (1966). Pettibone regarded the monotypic *Hermundura* Müller, 1858 as a questionable synonym of *Loandalia*. Later, Salazar-Vallejo (1990) redescribed the type species of *Hermundura*, *H. tricuspis* (as *Parandalia tricuspis*), designated a neotype, and established unequivocally that it represented a senior synonym of *Parandalia*. When Salazar-Vallejo (1998) synonymised *Parandalia* with *Loandalia*, *Hermundura* became the senior synonym of both *Parandalia* and *Loandalia*, but because Salazar-Vallejo

(1990) recommended the continuing use of the junior synonym name (*Parandalia*), the name *Hermundura* was ignored. However, under current ICZN (1999) rules, in which strict publication criteria need to be applied in order to suppress a senior synonym, we consider it appropriate to abide by the Principle of Priority and resurrect the senior synonym name for this taxon.

Emerson & Fauchald (1971) re-examined the type species of *Loandalia*, *L. aberrans*, and concluded that, as its name implies, it has several unique features that set it apart from other synclimines, most importantly the absence of notopodial spines (and notoacicula) and the presence of branchiae. They restricted the concept of the genus to include only the type species and moved the other species in the genus to *Parandalia*. Salazar-Vallejo (1998) demonstrated that the so-called branchiae were in fact enlarged nephridial papillae and, in his opinion, the presence of nephridial papillae could not be used as a feature to separate *Loandalia* from *Parandalia*. Further, because of contradictory information over whether notopodial spines

are present in the type – observed by Monro, but not by Emerson & Fauchald (1971) – this feature could not be used to diagnose the genus. We follow Salazar-Vallejo's (1998) interpretation of the type species, and his conclusion that *Parandalia* is a junior synonym of *Loandalia*. This action also addresses the concern of Licher & Westheide (1994) that monophyly of *Parandalia* was questionable.

The monotypic genus *Talehsapia* Fauvel, 1932 was also regarded as a junior synonym of *Loandalia*, albeit questionably (Pettibone 1966). The taxonomic history of *Talehsapia* and its single species *T. annandalei* Fauvel, 1932 is summarised by Salazar-Vallejo *et al.* (2001), who also redescribed specimens from the type locality. They concluded that the genus should be maintained and it can be recognised by its completely fused palps and the presence of denticulate bands, which originally were interpreted as jaws. However, we demonstrate herein using a large range of differently preserved specimens of *H. gladstonensis*, that these two features should not be used to distinguish *T. annandalei* from other *Hermundura*. Thus *Talehsapia* also becomes a junior synonym of *Hermundura*.

Four species of *Hermundura* are currently known from the Indo-west Pacific, *H. annandalei* comb. nov. (Thailand), *H. indica* (Thomas, 1963) comb. nov. (India), and two species from Australia, *H. fredrayorum* (Marks & Hocknull, 2006) comb. nov., from the type locality Moreton Bay near Brisbane, and *H. gladstonensis* (Marks & Hocknull, 2006) comb. nov. from the type locality Gladstone, NE Queensland (Table 1). In this paper we describe all available *Hermundura* specimens from northern Australia and New Guinea based on material held in the collections of Australia's natural history museums.

## MATERIALS AND METHODS

All specimens were fixed in 10% formaldehyde-seawater and preserved in 70% ethanol. Observations were made using a Nikon SMZ 1500 stereomicroscope and a Nikon Eclipse 80i compound microscope with Nomarsky optics; photographs were made on both microscopes using a Qimaging Micropublisher 5.0 RTV digital camera; stacked images were combined with Helicon Focus software (version 4.77) and line drawings were compiled from digital images using a Wacom Intuos 4 drawing pad with Adobe Illustrator CS2.

Generic and species level descriptions were constructed using the DELTA system, Descriptive Language for Taxonomy, a standardised format for coding taxonomic descriptions (Dallwitz 1980; Dallwitz & Paine 1986; <http://www.biodiversity.uno.edu.delta>). Features included in the generic description were not repeated at the species level and vice versa. The key was constructed manually. The distribution maps were made using PanMap software (Dipenbrock *et al.* 2000).

**Abbreviations.** The following abbreviations are used in this paper: AM – Australian Museum, Sydney; LACM

(formerly AHF) – Los Angeles County Museum of Natural History, Los Angeles; LIPI – Pusat Penelitian Oseanografi, Lembaga Ilmu Pengetahuan, Jakarta; MEU – Marine Ecology Unit, formerly belonging to NTM; NTM – Museum and Art Gallery, Northern Territory (formerly Northern Territory Museum), Darwin; QM – Queensland Museum, Brisbane.

## MORPHOLOGY OF *HERMUNDURA*

**Body.** *Hermundura* species have a more or less uniformly cylindrical body except for the anterior 5–10 segments which are inflated, and the posterior body may be slightly flattened. The body surface has a smooth to acrocolated texture, not shining or papillated like other pilargids. Pigmented subdermal glands may be present on the lateral body and the pygidium (as a pair of spots) (Fig. 1).

**Head.** The prostomium is reduced and indistinct, rectangular or ovate in shape, and together with the reduced palps the head appears bluntly triangular in shape. The palps are biarticulated (comprising a palpophore and a palpostyle) and separated from each other (though they may appear to be medially fused when the head is contracted). At least two species, *H. tricuspis* Müller, 1858 and *H. annandalei* comb. nov., are reported in the literature to have fused palps but this needs to be confirmed based on fresh specimens. Palpostyles maybe button-like or rod-like in shape and occur singly or in a pair within each palpophore (see Marks & Hocknull 2006). A palpal papilla is absent. Nuchal organs are not apparent. The antennae are absent. The eyes, if present, are subdermal, lying on the brain. The brain is often visible dorsally through the body wall as an elongate, tripartite structure projecting posteriorly from the prostomium and extending through the first few anterior chaetigers; the mid-brain often has paired subdermal eyespots. The first annulus (referred to in recent literature as both the peristomium or segment 1) lacks parapodia or tentacular cirri, and it may be set off from the prostomium or fused with it.

**Parapodia.** The parapodia in *Hermundura* are 'sub-biramous', with the anterior one or two chaetigers lacking notospines, and dorsal cirri are absent in all species except *H. aberrans* comb. nov. The chaetal lobe is rectangular, rounded distally and does not project far from the body wall. The ventral cirri are subdistal and start on chaetigers 3–8, thereafter they are present on all chaetigers. The start of the ventral cirri is a useful character to separate species. Nephridial papillae may be present on the posteroventral margin of the neuropodia of posterior chaetigers (only in *H. aberrans* comb. nov. and *H. maculata* comb. nov.).

**Chaetae.** The notochoetae include straight notospines (rarely absent, *H. aberrans* comb. nov.), which start on chaetigers 2–10, and a few accompanying capillaries. The first few notospines may be overlooked because they have not fully emerged from the parapodium, but they can be seen on slide-mounted specimens under a compound microscope. The first occurrence of notospines appears not to be body-

size dependent as in other pilargids (e.g. *Siganbra*), and is therefore a good species-level character. The neurochaetae are distinctive, hirsute capillaries that have a whorl of hairs along a variable portion of the chaeta. The notoaciculacae are absent, although some earlier authors have interpreted the single notospine as an emergent notoacicula (e.g. Hartman (1947)); a single neuroacicula is present, and the tip may be tapered or knobbed.

**Pygidium.** The pygidium is spoon-like with a dorsal concavity, and ovate to rounded. It bears 2, 3 or 5 anal cirri.

**Alimentary canal.** The anterior-most part of the alimentary canal consists of a short, non-muscular buccal tube which extends from the mouth posteriorly to a muscular pharynx. The buccal tube, which is exposed when the pharynx is partially everted, may carry one or a few hardened denticles which appear to be derived from the cuticle (Fig. 2A), however these features of the buccal tube appear not to be consistent within a species and therefore are given no taxonomic importance herein. Occasionally the denticles appear to be located within the pharynx itself (Figs 2C, 3D), nevertheless they resemble the denticles of the buccal tube rather than the ‘denticulated bands’ described by Salazar-Vallejo *et al.* (2001). When the proboscis is fully everted, a ring of up to 10 papillae can be seen at the junction between the buccal tube and the muscular pharynx.

On the anterior margin of the muscular pharynx a narrow light-refractive band of soft tissue encircles the opening. It appears to be homologous with the ‘denticulated bands’ that Salazar-Vallejo *et al.* (2001) found in *Talehsapia*. The intestinal caeca are absent.

## SYSTEMATICS

### Pilargidae Saint-Joseph, 1899

#### Synelminae Sallazar-Vallejo, 1986

##### *Hermundura* Müller, 1858

*Hermundura* Müller, 1858: 216. Gender feminine. Type species, by monotypy, *Hermundura tricuspis*. Recent, Santa Catarina Island, Brazil.

*Talehsapia* Fauvel, 1932: 251–252. Gender feminine. Type species, by monotypy, *Talehsapia annandalei*. Recent, Songkhla Lagoon, Thailand. New synonymy.

*Loandalia* Monro, 1936: 193. Gender feminine. Type species, by original designation, *Loandalia aberrans*. Recent, St Paul de Loanda, Angola.

*Parandalia* Emerson & Fauchald, 1971: 19. Gender feminine. Type-species, by original designation, *Parandalia ocularis*. Recent, Santa Barbara Channel, California, USA.

**Table 1:** Currently accepted *Hermundura* species worldwide, arranged chronologically, together with the original name and author, type locality and depth, and nomenclatural/taxonomic comments.

Original combination	Authority	Type locality, depth	Nomenclatural/taxonomic comments
<i>Hermundura tricuspis</i>	Müller, 1858	São Antonio de Lisboa, Santa Catarina Island, Brazil; intertidal	Neotype designated by Salazar-Vallejo (1990)
<i>Talehsapia amandalei</i>	Fauvel, 1932	Songkhla Lagoon, Thailand; no depth stated	Redescribed by Salazar-Vallejo <i>et al.</i> (2001)
<i>Loandalia aberrans</i>	Monro, 1936	Off St Paul de Loanda, Angola, 64–65 m	
<i>Loandalia fauveli</i>	Berkeley & Berkeley, 1941	Newport Bay, California, USA; intertidal	
<i>Loandalia americana</i>	Hartman, 1947	Biloxi, Mississippi, USA; intertidal	Synonym of <i>H. fauveli</i> according to Pettibone (1966).
<i>Loandalia gracilis</i>	Hartmann-Schröder, 1959	La Herradura, El Salvador; intertidal	Synonym of <i>H. fauveli</i> according to Pettibone (1966)
<i>Loandalia indica</i>	Thomas, 1963	Arabian Sea, off west coast of India; 15–18 m	
<i>Parandalia ocularis</i>	Emerson & Fauchald, 1971	Santa Barbara Channel, off southern California; 42–46 m	
<i>Loandalia maculata</i>	Intes & Le Loeuff, 1975	Off Ivory Coast, west Africa; 15–100 m	
<i>Parandalia bennei</i>	Solis-Weiss, 1983	Mazatlan Bay, Pacific coast of Mexico; 3.5–25 m	
<i>Loandalia riojai</i>	Salazar-Vallejo, 1986	Bahia de Manzanillo, Colima, Mexico; 30–80 m	
<i>Parandalia vivianneae</i>	Salazar-Vallejo & Reyes-Barragán, 1986	Laguna La Mancha, Veracruz, Gulf of Mexico; shallow water	
<i>Parandalia evelinae</i>	León-González, 1991	Baha California Sur, Mexico, west coast; 106 m	
<i>Loandalia salazarvallejoi</i>	León-González, 1991	Baha California Sur, Mexico, west coast; 80 m	
<i>Loandalia fredrayorum</i>	Marks & Hocknull, 2006	Moreton Bay, Queensland, Australia; 3–11 m	
<i>Loandalia gladstonensis</i>	Marks & Hocknull, 2006	Gladstone Harbour, Queensland, Australia; intertidal to 5 m	
<i>Hermundura philipi</i> sp. nov.	Glasby & Hocknull, 2010	North of Mornington Island, Gulf of Carpentaria, Australia; 35–45 m	

**Diagnosis.** Body long, slender, subcylindrical, inflated anteriorly; surface smooth to areolated. Prostomium and palps reduced; combined structure bluntly triangular. Palps biarticulated, separated from each other; palpostyles single or double; palpal papilla absent. Antennae absent. Prostomial eyes absent. Brain longer than wide, divided into fore-, mid- and hind-brain; forebrain bifurcate, divided anteriorly into 2 lobes, hind brain with 2 lobes; ocular spots present on mid- and hind-brain. First annulus lacks parapodia or tentacular cirri. Parapodia with notopodia reduced, notoaciculae absent and dorsal cirri usually absent. Ventral cirri present, subdistal. Notochaetae including emergent straight notospines and few capillaries. Neurochaetae hirsute capillaries. Neuroaciculae present. Pygidium spoon-shaped plaque (dorsal concavity), bearing 2, 3 or 5 anal cirri. Ring of distal papillae between buccal tube and pharynx; cuticular denticles of various shapes may be present on buccal tube or anterior pharynx, pharynx with a sphincter on anterior margin. Intestinal caecae absent. Nephridial papillae present or absent.

**Remarks.** In 1990 Salazar-Vallejo redescribed the only species of *Hermundura*, *H. tricuspis* (as *Parandalia tricuspis*) and designated a neotype. Later (1998) he synonymised *Parandalia* with *Loandalia*. Therefore, *Hermundura* became the oldest available name for the taxon. Salazar-Vallejo (1990) stated that the name *Hermundura* "has not been used formally for a long time" and should it be adopted... "confusion would result". However, under the present ICZN Code (1999) the younger name *Loandalia* can only be used by successfully arguing the ease for 'prevailing usage' (ICZN 1999: Article 23.9.1.2). However, *Loandalia* is a rarely reported taxon and it would be difficult to satisfy the publication criteria set out under Article 23.9.1.2, especially because other names such as *Parandalia* and *Talehsapia* have also been used for members of the taxon in the last 50 years. The issue would almost certainly need to be referred to the Commission for a ruling. Therefore, the simplest and most effective option is to apply the Principle of Priority strictly and use the oldest available generic name, which is *Hermundura*, for the taxon.

We have expanded the diagnosis of *Hermundura* slightly to include the newly synonymised *Talehsapia* Fauvel, 1932. *Talehsapia* was differentiated from other synelmine pilargids by its completely fused palps and the presence of pharyngeal denticulate bands (Salazar-Vallejo *et al.* 2001). However, examination of a large number of specimens of *Hermundura* during this present study have shown that members of this genus also have palps that are very short and retractile, and that in the retracted state the palps often appear to be fused (Fig. 3A,B) as in *Talehsapia*. Further, although not mentioned by Salazar-Vallejo *et al.* (2001), the palps of *Talehsapia* appear to be bi-articulated with minute bifid palpostyles (see his fig. 1c), which is a condition only known in some species of *Hermundura*. Finally, *Hermundura* species also have

pharyngeal structures resembling denticulate bands. As Salazar-Vallejo *et al.* (2001) correctly pointed out, the bands are not true jaws as described by Fauvel (1932) because they are not a solid structure nor do they have cusps or any other features normally associated with jaws. He observed that the denticulate bands are symmetrical but discontinuous laterally, and 'rugose' or 'granular' due to the presence of 'many tiny denticles'. Bands of the same form (Fig. 2D,E) and texture (Fig. 2F) were also observed in our material of *Hermundura*, although the degree of granularity was generally less in our material. We believe that the granularity represents the minute protruberances (e.g. papillae) in the overlying tissue, because the graininess in our specimens extends beyond the limits of the bands (Fig. 2F). The bands appear to represent a sphincter because of their position at the anterior opening of the pharynx.

*Hermundura gladstoneensis* (Marks & Hocknull, 2006)  
comb. nov.

(Figs 1, 2A–F, 3A–N, 5A)

*Loandalia gladstonensis* Marks & Hocknull, 2006, 65–66, fig. 3a–d; Hocknull & Glasby 2009: 544 (in part).

**Material examined.** HOLOTYPE – QM G222948, Gladstone Harbour, 23°51.0'S, 151°37.0'E, coll. S.A. Marks, 26 July 2002. Additional material: AUSTRALIA: **Western Australia:** Port George, Kimberley coast, NTM W.23378, 15°23'S, 124°42'E, coll. J. Jelbart. **Northern Territory:** Darwin Harbour, approx. 12°30'S, 130°47'E, 1–21 m, coll. MEU, July 1993/March 1994, NTM W.10296, NTM W.10297, NTM W.10305, NTM W.10310, NTM W.10298, NTM W.10299, NTM W.10302, NTM W.10307, NTM W.10304, NTM W.10308, NTM W.10300, NTM W.10306, NTM W.10301, NTM W.10309, NTM W.10303, NTM W.13853, NTM W.13844, NTM W.13849, NTM W.13848, NTM W.13868, NTM W.13867, NTM W.13862, NTM W.13864, NTM W.13874, NTM W.13846, NTM W.13845, NTM W.13847, NTM W.13851, NTM W.13843, NTM W.13850, NTM W.13859, NTM W.13860, NTM W.13878, NTM W.13863, NTM W.13870, NTM W.13854, NTM W.13861, NTM W.13856, NTM W.13852, NTM W.13857, NTM W.13876, NTM W.13858, NTM W.13871, NTM W.13879, NTM W.13865, NTM W.13877, NTM W.13869, NTM W.13872, NTM W.13855, NTM W.13866, NTM W.13873, NTM W.13875; opposite Port, Wickham Point, NTM W.23368, 12°31.107'S, 130°52.485'E, coll. K. Metcalfe, Dry Season 2005; Bleesers Creek, NTM W.23369, 12°27.5713'S, 130°54.7586'E, coll. M. Neave, 16 April 2007; Hudson Creek, NTM W.22284 (includes DNA sample), 12°28.93'S, 130°55.6'E, coll. M. Neave, 1 May 2007; Charles Darwin National Park, NTM W.22277 (includes DNA sample), 12°27.43'S, 130°52.01'E, coll. M. Neave, 20 April 2007, NTM W.22304, 12°27.43'S, 130°52.01'E, coll. M. Neave, 20 August 2007, NTM W.22318, 12°27.43'S, 130°52.01'E, coll. M. Neave, 2 August 2007; Kitchener Bay, NTM W.21120, 12°28.09'S,



Fig. 1. *Hermundura gladstonensis*, entire animal approx. 12 mm long, lateral view, head facing downwards. Non-type specimen NTM W.23395. Photograph: C. Glasby.

130°50.478'E, 3.3 m, coll. C. Clark, 23 April 2007, NTM W.19239, 12°28.11'S, 130°50.83'E, 1 m, URS consultants, 22 September 2004. Melville Bay, Govc, approx. 12°12'S, 136°42'E, 5–18 m, coll. J.R. Hanley, July 1991/March 1992, NTM W.16824, NTM W.16825, NTM W.16828, NTM W.16830, NTM W.16831, NTM W.16832, NTM W.16833, NTM W.16834, NTM W.16836, NTM W.16842, NTM W.16846, NTM W.16848, NTM W.16849, NTM W.16850, NTM W.16852, NTM W.16853, NTM W.16855, NTM W.16856, NTM W.8229, NTM W.16826; NTM W.16840, NTM W.16841, NTM W.16843, NTM W.16851, NTM W.16844, NTM W.16837, NTM W.16835, NTM W.16838, NTM W.16839, NTM W.16845, NTM W.16847, NTM W.16854, NTM W.16823, NTM W.16827, NTM W.16829; Mangrove Creek, 12°12'S, 136 43'E, coll. NT Fisheries Department, 22 August 1971 NTM W.592; Bing Bong, McArthur River, 15 37'S, 136 23'E, coll. MEU, September

1992–March 1993, NTM W.7800. Queensland: Burnett River Estuary, NTM W19341, 24 46'S, 152 25'E, coll. P. Crosser, November 1987; AM W.13200, Gladstone, Auckland Creek, St. 4, coll. P. Saenger, August 1976; AM W13568, Gladstone, Calliope River, St. 2, coll. P. Saenger, May 1976. INDONESIA: Papua, Timika, approx. 5°S, 137°E, NTM W.23370, coll. LIPI, 9 August 2003, NTM W.23371, coll. LIPI, 28 June 2004, NTM W.23372, coll. LIPI, June 2004, NTM W.23373, coll. LIPI, 28 June 2004, NTM W.23374, coll. LIPI, 28 June 2004, NTM W.23375, coll. LIPI, 9 November 2009, NTM W.23376, coll. LIPI, 24 June 2004, NTM W.23377, coll. LIPI, 24 October 2002, NTM W.23379, NTM W.23380, NTM W.23381, coll. LIPI, 1 August 2002, NTM W.23382, coll. LIPI 28 June 2004, NTM W.23383, coll. LIPI, 28 June 2004, NTM W.23384, coll. LIPI, 28 June 2004, NTM W.23385, coll. LIPI 28 July 2004, NTM W.23386, coll. 28 June 2004, NTM W.23387, coll. LIPI 1 July 2004, NTM W.023388, coll. 1 July 2004, NTM W.23389, coll. LIPI, coll. LIPI, 1 July 2004, NTM W.23390, coll. LIPI, 29 July 2004, NTM W.23391, coll. LIPI, 1 July 2004, NTM W.23392, coll. LIPI 28 June 2004, NTM W.23393, coll. LIPI, NTM W.23394, coll. LIPI, August 2004, NTM W.23395, coll. LIPI 19 November 2009; Digul, approx. 7°S, 138°E, NTM W.23396, coll. LIPI, October 2002, NTM W.23397, coll. LIPI, 22 October 2002, NTM W.23398, coll. LIPI, 21 October 2002, NTM W.23399, coll. LIPI, 22 October 2002, NTM W.23400, coll. LIPI, 17 October 2002, NTM W.23401, coll. LIPI, October 2002.

**Diagnosis.** Palps with bifid, divergent palpostyles; buccal tube with 2–5 peg-like structures, honey-coloured to clear, or lacking any apparent structures; dorsal cirri absent; ventral cirri present from chaetiger 5; notopodial spines present from chaetiger 2, initially small and embedded, large and emergent from chaetiger 7–12; 5–9 neuropodial chaetae; neuroaciculae more or less tapered, but may have coloured distal knobs in mid-anterior body; pygidium bearing 3 anal cirri, middle one centrally positioned on plaque.

**Description.** Material examined ranges in size from 3.7–60 mm long, 0.4–1.5 mm wide (maximum width excluding parapodia), bearing 30–130 chaetigers. Brown pigment patches on lateral body and paired circular-shaped patches on pygidium (fading over time in alcohol). Body surface arcolated; anterior body region (chaetigers 4–5) inflated. Brain with 2 pairs of pigment spots – one pair on mid-brain, other pair on posterior lobes; reddish-brown to black. Palps biarticulated, separate from each other; palpostyles rod-like, bifid. Palpophores not fused. Buccal tube with 4–5 peg- or jaw-shaped denticles, or absent; honey-coloured to clear. Pharynx with distal ring of 10 papillae (rarely 8); all papillae more or less same size.

Notopodial lobes low (absent on first 4–6 chaetigers). Notochaetae comprising spines and capillaries; spines present from chaetiger 2, but not fully emergent until

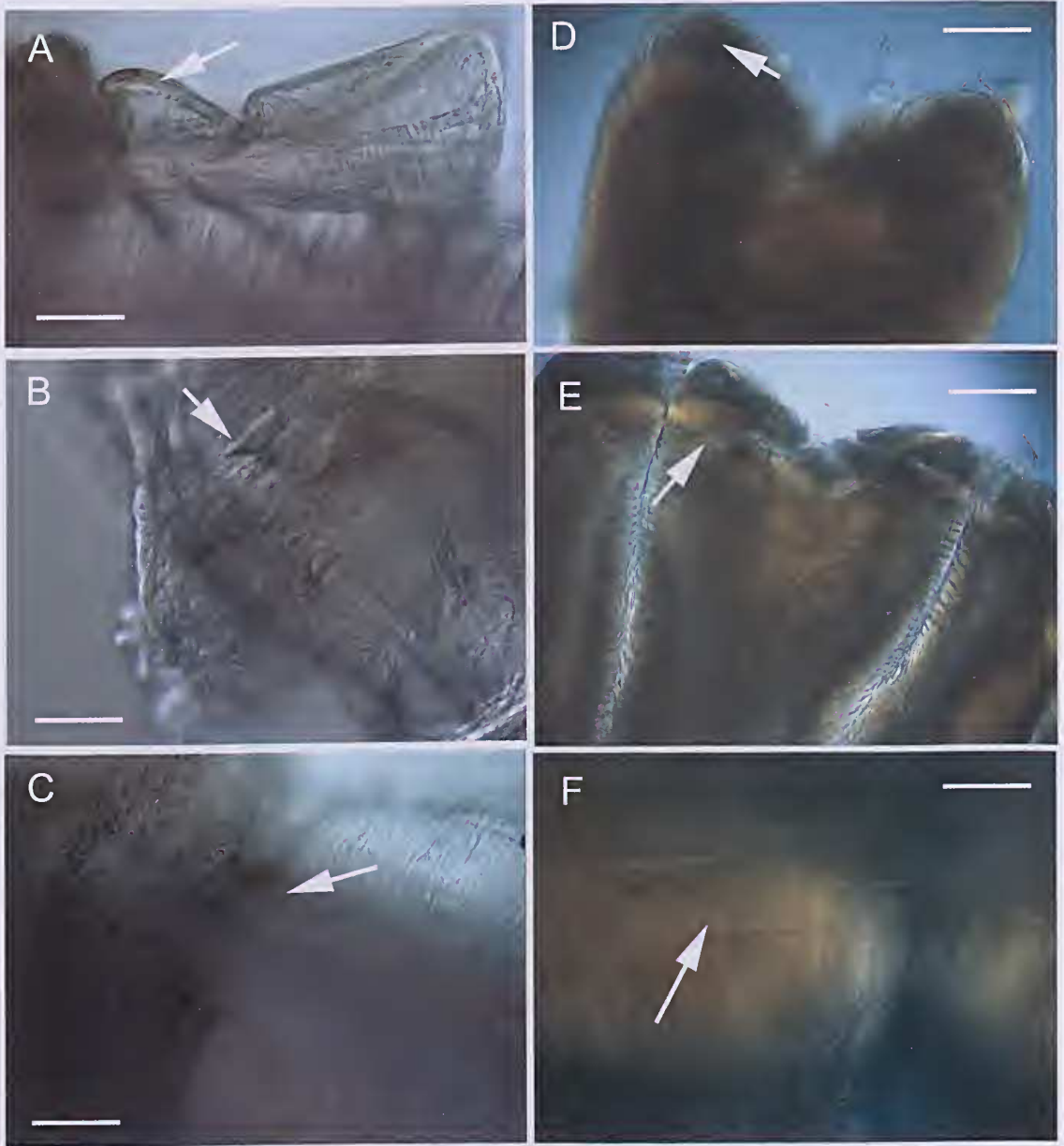


Fig. 2. *Hermundurina gladstonensis*, structures associated with anterior alimentary canal including buccal tube (A–C) and pharynx (D–F): A, jaw-like denticle (NTM W.23395); B, conical denticle (NTM W.23392); C, sickle-shaped denticle (NTM W.23386); D, undissected pharynx, anterior end, showing laterally well-developed musculature resembling jaws (NTM W.22304); E, dissected pharynx, anterior end, showing transverse sphincter and longitudinal muscle sutures (NTM W.22318); F, dissected pharynx showing close up of sphincter (NTM W.22318). Scale bars: A–E, 0.1 mm; F, 20  $\mu$ m

chaetigers 7–8, some with reddish-brown colouring distally (may also fade in alcohol); spines well developed until last chaetiger. Notopodial capillary chaetae present from chaetiger 2. Notoaciaculae absent. Neuropodial lobe digitiform, very low on first 1–3 chaetigers, gradually increasing in size to maximum length in mid body. Ventral cirri present from chaetiger 5. Neurochaetae capillary-like, with numerous transverse rows of slender teeth over short

portion of chaeta, 5–9 per fascicle. Neuroaciaculae present, distally knobbed or tapered (knob-tipped types sometimes present on chaetigers 8–22). Paired lateral anal cirri present, papilliform. Mid-anal cirri present, papilliform, centrally positioned on plate. Anal opening dorsal.

**Remarks.** The large amount of material available for study, covering a wide geographic range, has allowed us to document the intraspecific variability of this common

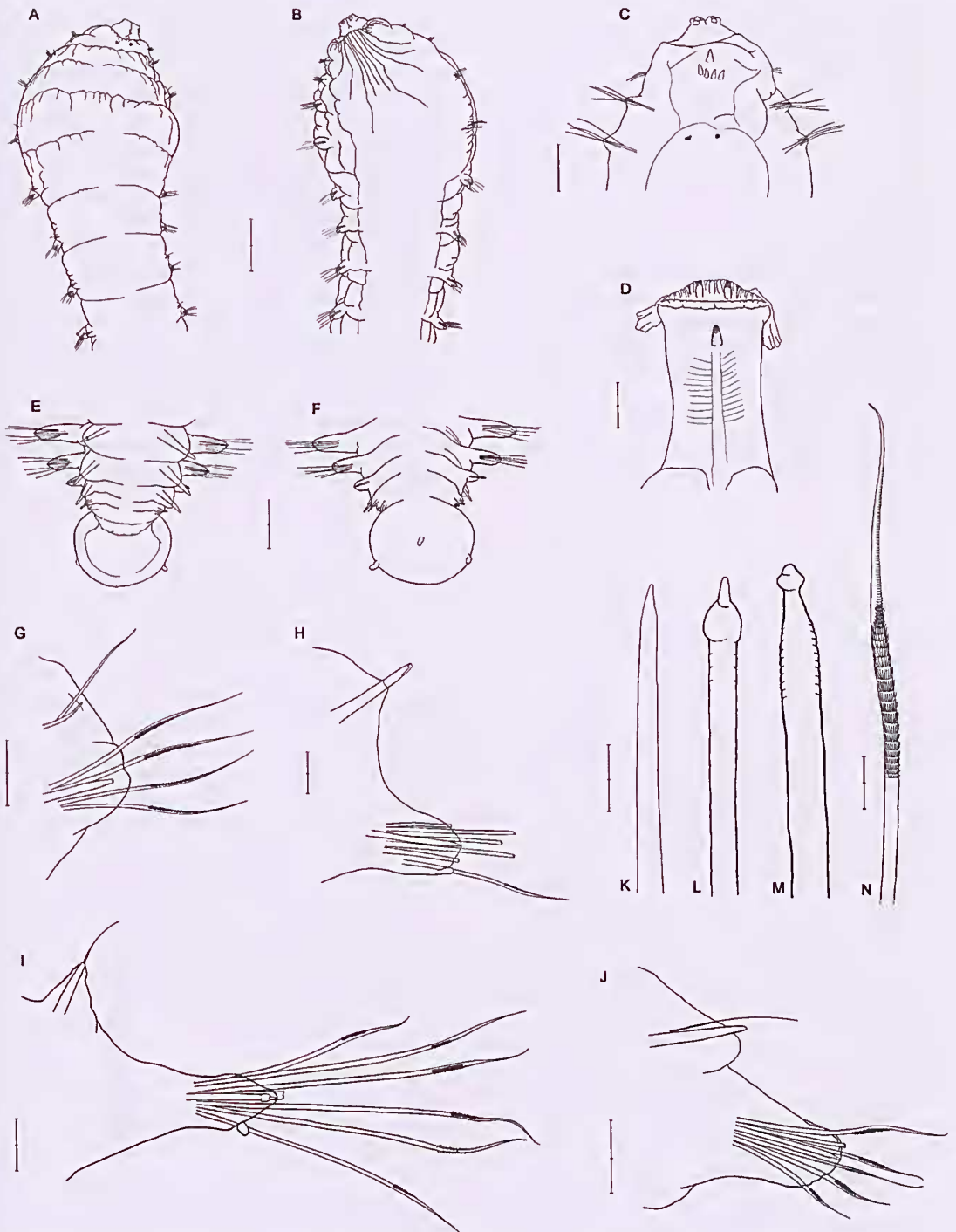


Fig. 3. *Hermundura gladstonensis*, A, anterior end, dorsal view (NTM W.22318); B, anterior end, ventral view (NTM W.22318); C, anterior end, dorsal view, specimen partially cleared with glycerol to show buccal denticles (NTM W.23373); D, pharynx dissected from body showing denticles (NTM W.23386); E, pygidium dorsal view (NTM W.22318); F, pygidium ventral view (NTM W.22318); G, parapodium of chaetiger 2 (NTM W.22318); H, parapodium of chaetiger 60 (NTM W.22318); I, parapodium of chaetiger 17 (NTM W.23373); J, parapodium of chaetiger 13 (NTM W.23373); K, L, M, neuroacicula, anterior chaetiger (NTM W.22318); N, hirsute neurochaeta, anterior chaetiger (NTM W.22318). Scale bars: A, B: 0.5 mm; C–F, 0.2 mm; G–J, 0.1 mm; K–M, 40  $\mu$ m; N, 25  $\mu$ m.

species, which until now was only known from the type description and the brief account of the forms from the Gulf of Carpentaria by Hocknull & Glasby (2009) (which is actually a composite of two species – *H. gladstonensis* and *H. philipi* sp. nov.). Two of the most interesting variable features are the presence of cuticularised denticles on the buccal tube and the pigmented knobbed-tipped neuroaaciculae. The cuticularised denticles may be elongate and resemble serrated jaws (Fig. 2A), or be conical to sickle-shaped (Figs 2B,C; 3C,D); the denticles numbered from 1 to 4 and were sometimes arranged 2 ventrally and 2 dorsally. Their occurrence within the taxon appears likely to be size-related (i.e. more common in larger worms) rather than geographic- or sex-related. Hardened structures of the buccal tube have not been reported previously for the family, although similar structures of the pharynx were thought to exist (see Remarks for genus).

Similarly, variability in the presence or absence of knob-tipped neuroaaciculae could not be easily explained. They were observed only in parapodia of the first 20 or

so chaetigers; the neuroaaciculae of some individuals were always tapered (Fig. 3K), whilst those of others showed various degrees of knobiness (Fig. 3 L, M). In addition, the presence of knobbed-tipped neuroaaciculae appeared to correspond with a reddish pigment spot at the tip of the same neuropodium – whether the tip itself was red or it was the tissue of the distal neuropodium could not be established. Knob-like protruberances have also been reported by Salazar-Vallejo (1990) on the distal region of the notopodial spines of the type species (*H. tricuspis*) raising the possibility that they represent aberrations common to members of the genus.

**Habitat.** *Hermundura gladstonensis* occurs from the lower intertidal zone to about 20 m in soft sediments (for the northern Australia material). It is not present in the higher intertidal zone under the mangrove canopy in Darwin Harbour (CJG pers. obs.).

**Distribution.** Sahul shelf including northern Australia and eastern Indonesia; also coastal north-eastern Australia, excluding the Great Barrier Reef (Fig. 5A).

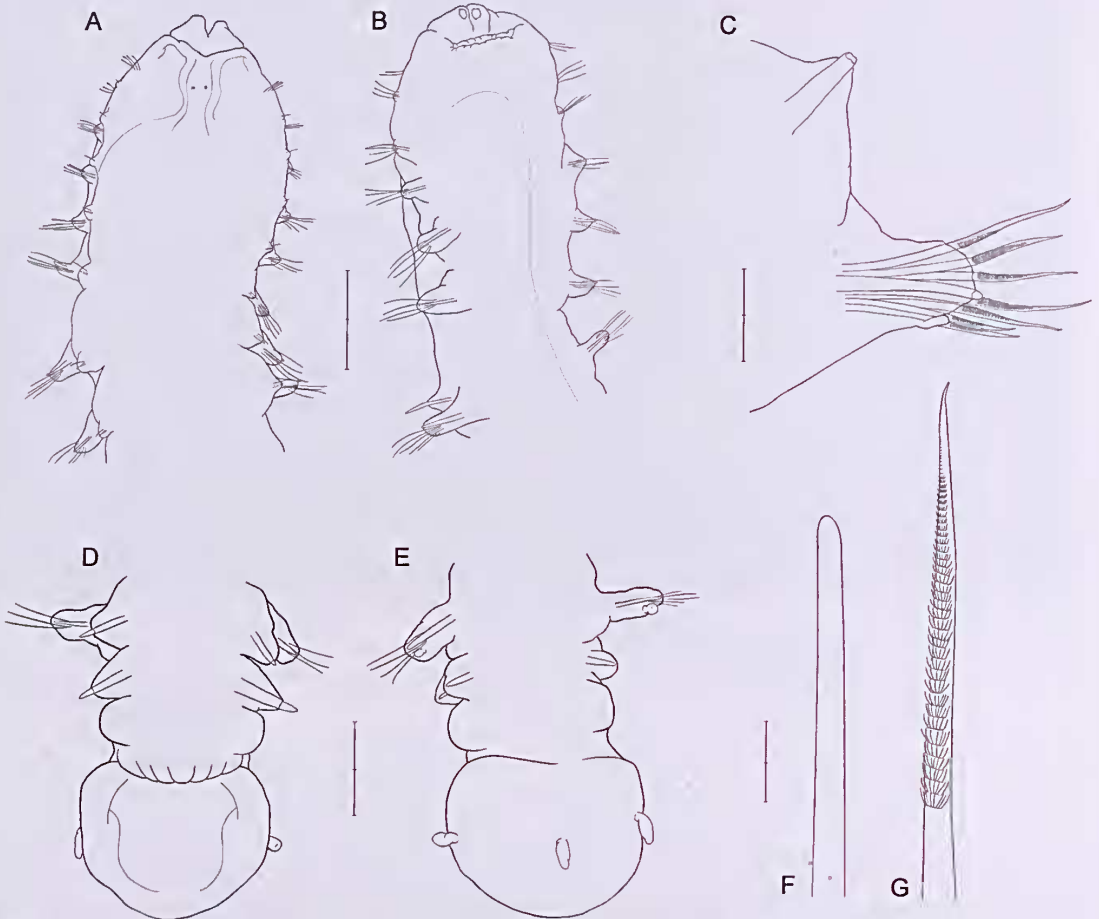


Fig. 4. *Hermundura philipi* sp. nov. Holotype, A, anterior end, dorsal view; B, anterior end, ventral view; C, parapodia from chaetiger 16; D, pygidium dorsal view; E, pygidium ventral view; F, Neuroaacicula, anterior chaetiger; G, hirsute neurochaeta, anterior chaetiger. Scale bars: A, B, 0.2 mm; C, 0.05 mm; D–E, 0.1 mm; F–G, 15  $\mu$ m.



*Hermundura philipi* sp. nov.

(Fig. 4A–G, 5B)

*Loandalia gladstonensis* Marks & Hocknull, 2006, 65–66, fig. 3a–d; Hocknull & Glasby 2009: 544 (in part).

**Material examined.** HOLOTYPE – QM G230618, Queensland, Gulf of Carpentaria, north of Mornington Island, coll. CSIRO R.V. *Southern Surveyor*, 15°59.4486'S, 139°53.346'E, 37.8 m, 2 March 2005. PARATYPES – collection details as for holotype, 1(QM G230616), 15°48.4818'S 139°47.4612'E, 42.6 m, coll. 1 March 2005; 3(QM G230619), 16°0.5412'S, 139°45.5016'E, 39.8 m, coll. 3 March 2005; 1(QM G230620), 16°1.3464'S, 139°36.0294'E, 39.8 m, coll. 3 March 2005; 1(QM G230624), 15°48.5046'S, 139°45.5112'E, 43.6 m, coll. 4 March 2005; 1(NTM W.21979), 15°56.5596'S, 139°41.109'E, coll. 2 March 2005; 1(NTM W.21980), 15°55.4136'S, 139°53.7162'E, coll. 2 March 2005; 1(NTM W.21981), 16°0.5676'S, 139°37.4982'E, coll. 3 March 2005.

**Non-type material.** QUEENSLAND: Gulf of Carpentaria, north of Mornington Island, coll. CSIRO R.V. *Southern Surveyor*, QM G230611, 15°58.3164'S, 139°39.3606'E, 41.4 m, coll. 4 March 2005; QM G230612, 16°9.5718'S, 139°44.4606'E, 35.4 m, coll. 28 February 2005; QM G230613, 15°55.4622'S 139°28.497'E, 43 m, coll. 27 February 2005; QM G230614, 15°58.488'S, 139°40.4964'E, 41.4 m, coll. 27 February 2005; QM G230615, 15°59.5026'S, 139°41.4948'E, 40.6 m, coll. 1 March 2005; QM G230617, 15°58.9056'S, 139°44.0076'E, 39.8 m, coll. 2 March 2005; QM G230621, 16°0.5676'S, 139°37.4982'E, 41.6 m, coll. 3 March 2005; QM G230622, 16°7.9314'S, 139°46.479'E, 37.8 m, coll. 4 March 2005; QM G230623, 15°58.3164'S, 139°39.3606'E, 41.4 m, coll. 4 March 2005; QM G230625, 15°59.6574'S, 139°39.2496'E, 41 m, coll. 4 March 2005; QM G230626, 16°9.4224'S, 139°39.5118'E, 34.6 m, coll. 4 March 2005; QM G230627, 15°59.4978'S, 139°42.498'E, 39.8 m, coll. 4 March 2005; QM G230628, 16°0.6588'S, 139°35.2044'E, 41.8 m, coll. 5 March 2005; QM G230629, 15°58.5228'S, 139°44.4756'E, 40.4 m, coll. 5 March 2005; QM G230630, 15°57.4908'S, 139°36.5082'E, 41.8 m, coll. 5 March 2005; QMG 230631, 16°1.3656'S, 139°46.4376'E, 39.4 m, coll. 5 March 2005; QM G230632, 16°1.6434'S, 139°39.7044'E, 41.4 m, coll. 6 March 2005.

**Diagnosis.** Body with constriction after anterior inflated segment (between chaetigers 6–7); palps with simple, button-like palpostyle; pharynx and buccal tube unarmed; dorsal cirri absent; ventral cirri present from chaetiger 7; notopodial spines present from chaetiger 5, initially small and embedded, large and emergent from chaetiger 7; 5 or 6 neuropodial chaetae, with large proportion of chaetae hirsute; neuroaediculae of mid-body tapered; pygidium bearing 3 anal cirri, middle one located centrally on plaque.

**Description.** Holotype 6.0 mm long, 0.45 mm wide (max. width including parapodia) for 35 chaetigers. Paratypes range in size from 2.2–10.0 mm long, 0.40–0.50 mm wide, with 21–55 chaetigers. Brown pigment

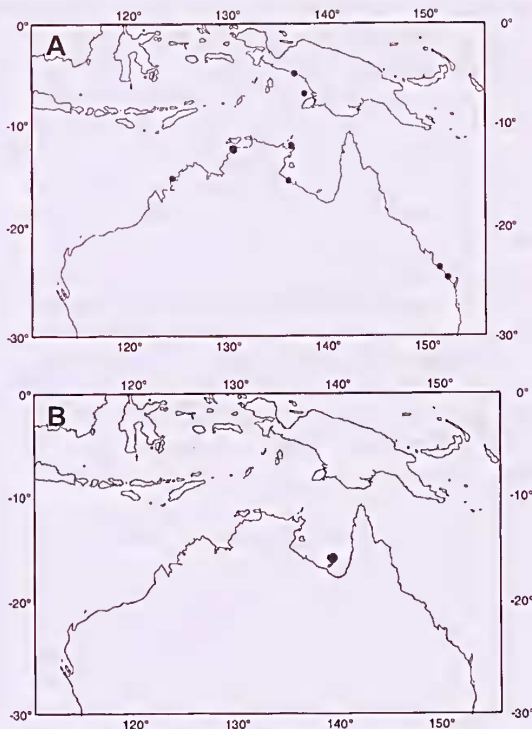


Fig. 5. A, Distribution of *Hermundura gladstonensis*; B, distribution of *H. philipi* sp. nov.

patches on lateral body and paired circular-shaped patches on pygidium. Body surface arcolated anteriorly, smooth posteriorly; anterior body region (chaetigers 1–6) inflated, with slight constriction between chaetigers 6–7 (Fig. 4A,B). Brain with 3 pairs pigment spots; 2 pairs on mid-brain and 1 pair on hind-brain. Palps biarticulated, separate from each other; palpostyles button-like; simple. Buccal tube with tooth-like structures not observed.

Notopodial lobes low (absent on first 6 chaetigers). Notochaetae comprising spines and capillaries; spines present from chaetigers 5–6 very small and not emergent initially; from chaetiger 7 onward, large fully developed emergent spine to last chaetiger (Fig. 3C). Notopodial capillary chaetae present from chaetiger 2, 0–3 per fascicle. Notoaediculae absent. Neuropodial lobe digitiform. Ventral cirri present from chaetiger 7. Neurochaetae capillary-like, with numerous transverse rows of slender teeth covering large portion of chaeta, 5–6 per fascicle (Fig. 4G). Neuroaediculae present, tapering to a slightly expanded tip (Fig. 4F). Pygidium plate-like (Fig. 4D). Paired lateral anal cirri present, papilliform; mid-ventral anal cirri present, positioned centrally on plate (Fig. 4E). Anal opening dorsal.

**Intraspecific variation.** The largest non-type specimen was 16 mm long, 0.75 mm wide for 59 chaetigers (incomplete). Specimen QM G230627 was encased in a hyaline tube, similar to those of species of *Phyllochaetopterus* and *Spiochaetopterus* (Chaetopteridae).

It is therefore possible that *H. philipi* is commensal with a chaetopterid, especially because other *Hermundura* species have also been found associated with *Phyllochaetopterus* tubes (Berkeley & Berkeley 1941; Thomas, 1963), and other pilargids are known to be commensal with chaetopterids, for example, *Pilargis berkeleyae* is known to be associated with *Chaetopterus* tubes (Britaev 1993).

**Etymology.** The new species is named in honour of Philip Marks, the junior author's father.

**Remarks.** The brief account of *Hermundura gladstonensis* by Hoeknull & Glasby (2009) is a composite of two species, *H. gladstonensis* and *H. philipi* sp. nov.

The new species appears to be closest in morphology to *H. fredrayorum* and *H. indica* (Thomas, 1963), which also have ventral cirri starting on chaetiger 7. *Hermundura fredrayorum* differs in being a much larger species (181 mm long, 2.55 mm wide with chaetae), with its notopodial spines starting on chaetiger 9, in having a greater number of both notopodial capillaries (2–4) and neuropodial chaetae (20–24), and in lacking a mid-ventral anal cirrus. *Hermundura indica* differs in having the first few chaetigers biramous, notopodial spines present from chaetiger 7, and having 5 anal cirri. The new species may be distinguished from all other species in the Indo-west Pacific region using the key below.

**Habitat.** *Hermundura philipi* occurs in about 35–45 m in soft sediments.

**Distribution.** This species is presently known only from the southern Gulf of Carpentaria (Fig. 5B).

## DISCUSSION

The expanded definition of *Hermundura* containing both *Talehsapia* and *Parandalia* now gives the genus a total of 17 species worldwide (Table 1). Three species of *Hermundura* occur in the northern Australian region. Although *H. gladstonensis* and *H. philipi* potentially overlap in distribution in the southern Gulf of Carpentaria, it appears that they are disjunct based on habitat preference. *Hermundura gladstonensis* is restricted to coastal areas down to 20 m, whereas *H. philipi* occurs in waters from 35–45 deep. This pattern of habitat partitioning agrees with the general pattern identified for the northern Australia Pilargidae (Hoeknull & Glasby 2009), viz. an inshore component (e.g. *H. gladstonensis*, *H. fredrayorum*), a shallow shelf component (*H. philipi*), and a deep shelf component (includes other pilargids, but no species of *Hermundura* in this category).

Interestingly, *Hermundura fredrayorum* was not reported in this study. It appears to have a limited distribution in the subtropical east coast of Australia. The three species may be distinguished from each other and from remaining Indo-west Pacific *Hermundura* species using the following key.

## Key to *Hermundura* species of Australia and the Indo-west Pacific

1. Ventral cirri present from chaetiger 4; palpostyles bifid ..... *H. annandalei*  
— Ventral cirri present from chaetiger 5; palpostyle bifid, divergent ..... *H. gladstonensis*  
— Ventral cirri present from chaetiger 7; palpostyles simple ..... 2
2. Notopodial spines present from chaetiger 5, initially small and embedded, large and emergent from chaetiger 7; pygidial plate with 3 anal cirri ..... *H. philipi* sp. nov.  
— Notopodial spines present from chaetiger 7; pygidial plate with 5 anal cirri ..... *H. indica*  
— Notopodial spines present from chaetiger 9, initially small and embedded, large and emergent from midbody; pygidial plate with 2 anal cirri ..... *H. fredrayorum*

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